Juvenile Marijuana Arrests in the Era of Adult Legalization

Caislin Firth, MPH, PhD Candidate, Epidemiology Department, University of Washington
Agenda

- Background of marijuana legislature in Oregon
- Juvenile justice implications?
- What are the impacts of adult legalization on juvenile justice?
  - Study Methods
  - Results
    - What are the statewide impacts of adult legalization on juvenile justice?
    - Did legalization impact racial & ethnic disparities in juvenile justice?
Marijuana policies in Oregon
History of Marijuana Policies in Oregon

1973
Oregon became 1st state to decriminalize marijuana.

1998
Oregon Medical Marijuana Act passed, permitted marijuana use for specific medical conditions.

2005
Oregon Medical Marijuana Program (OMMP) increased possession & plant limits. Patients allowed to possess ≤24 oz & grow 6 mature plants + 18 immature plants. Created grow site registry & cards for caregivers responsible for grow sites.

2011
OMMP fees for patients & caregivers double (from $100 to $200).

2013
Medical marijuana dispensary registry implemented & regulated by the Oregon Health Authority (OHA). Proliferation of medical dispensaries.

July 2015
Possessing small amounts of marijuana (≤1oz) for people 21+ years old is legalized.

June 2016
Soft opening expanded to sell low dose edibles, topicals & extracts

Oct 2015
Soft opening of marijuana retail market. Existing medical marijuana dispensaries allowed to sell limited quantities of useable marijuana to people 21+ years old. Regulated by OHA.

Nov 2014
Legalization of possession, local production, processing and sale of marijuana to people 21+ years old.

Jan 2017
Full marijuana retail market opening under the authority of Oregon Liquor Control Commission (OLCC).
Measure 91
Select Marijuana laws in Oregon

### 21 years +

<table>
<thead>
<tr>
<th>Crime</th>
<th>Before Legalization</th>
<th>After Legalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possession &gt;8 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unlawful Delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery to minor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### < 21 years

<table>
<thead>
<tr>
<th>Crime</th>
<th>Before Legalization</th>
<th>After Legalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possession: &lt;1 oz</td>
<td></td>
<td>Marijuana MIP</td>
</tr>
<tr>
<td>Delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacture</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### All ages

<table>
<thead>
<tr>
<th>Crime</th>
<th>Before Legalization</th>
<th>After Legalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of marijuana in public place</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Providing to intoxicated person</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowing consumption by minor on property</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homedrown in public view</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Producing or storing homemade extract</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giving marijuana as a prize</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of marijuana while driving</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Concerns for juvenile justice

- Proponents argue that legalization will decrease marijuana-related crimes & racial/ethnic disparities among adults\(^1\)
- Youth are exposed to commercialized cannabis, yet it remains an illegal substance
- Legalized states have seen a reduction in adult arrests\(^2-4\)
- What about the effects on juvenile justice?

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Preliminary Evidence: Adult marijuana-related crimes in legalized states

Washington State\(^1\)  

Colorado\(^2\)  

Oregon\(^3\)

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Preliminary Evidence: Juvenile marijuana-related crimes

Colorado¹

- Legalization: 583
- Market opening: 453

Oregon²

- Legalization of Adult possession (July 2015)
- Measure 91 passed (Nov 2014)
- Market opens (Oct 2015)

*Prior to 2016, marijuana crimes only included referrals for possession of < 1 oz of marijuana.

Impacts of adult legalization on juvenile justice in Oregon: Methods
Study Objectives

1. Assess the statewide impacts of legalization of adult possession of marijuana on juvenile marijuana-related criminal allegations.

2. Determine whether legalization has impacted racial/ethnic disparities in juvenile marijuana-related allegations.
Data source:
Juvenile Justice Information System

Figure from the Oregon Youth Authority, retrieved from www.oregon.gov/OYA
### Study population: All marijuana-related allegations

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>All marijuana-related allegations that occurred between Jan 2012–Sep 2018</td>
<td>20,180</td>
</tr>
<tr>
<td>Allegations reported from Oregon law enforcement agencies (federal, tribal, &amp; out of state jurisdictions were excluded).</td>
<td>20,150</td>
</tr>
<tr>
<td>Youth had complete demographic information (age, race/ethnicity &amp; gender).</td>
<td>18,826</td>
</tr>
<tr>
<td>Youth was 10–17 years of age at the time of the crime.</td>
<td>18,779</td>
</tr>
</tbody>
</table>

- **Nov 2014**: Measure 91 passed (legalization)
- **Oct 2015**: Early retail sales of cannabis for adults
- **Jul 2015**: Legalization of possession for adults
Analytic methods

- Our study design was an ecologic interrupted time series analysis.

- The data was structured as monthly counts of marijuana-related allegations within each county and demographic group (race/ethnicity, age group & gender).

- Our primary independent variable corresponded to policy implementation:
  - Adult legalization of possession of small amounts of marijuana.
Analytic methods (2)

- A negative binomial model with random effects was fit to answer each research question.
- Covariate adjustment included:
  - Demographic effects (race/ethnicity, age group & gender)
  - System effects (number of sworn officers, urbanicity of county, secular trends)
- Baseline differences between counties were addressed by including a random intercept.
- Counts of allegations were offset by age-specific population estimates of cannabis-using youth.
  - This was important to consider how changes in youth use could impact allegations over time.

Statewide youth cannabis use

Adult legalization of small amounts of marijuana
Study Question 1: Statewide impacts
Results: Statewide juvenile marijuana allegations over time

Among all youth (10–17 years)

Adult legalization of small amounts of marijuana

Among cannabis-using youth
Results: Statewide juvenile marijuana allegations over time

Adult legalization of small amounts of marijuana
## Results: Statewide impacts

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Rate Ratio among all youth*</th>
<th>Rate Ratio among Cannabis users*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legalization of adult possession (July 2015)</td>
<td>1.361</td>
<td>1.375</td>
</tr>
<tr>
<td>Time trend before legalization (in months)</td>
<td>0.987</td>
<td>0.990</td>
</tr>
<tr>
<td>Change in time trend after legalization (in months)</td>
<td>1.009</td>
<td>1.005</td>
</tr>
</tbody>
</table>

All parameter estimates were statistically significant, p-value (<0.05).

- On average, the rate of marijuana allegations among cannabis-using youth (10-17 years) increased by 38% after legalization in Oregon.
- The trend in marijuana allegations among cannabis-using youth flattened after legalization.
- If Oregon had not legalized marijuana, we would expect 450 fewer allegations each year among cannabis-using youth.

*The multi-level negative binomial model included a random intercept by county effect and was offset by county-level population estimates for age-specific cannabis users. The effects of age, race/ethnicity, gender, month of allegation & count of sworn police officers within each county were adjusted for.
Results: Statewide impacts (2)

- If Oregon had not legalized marijuana, we would expect 450 fewer marijuana-related criminal allegations each year.
Study Question 2: Racial disparities
Results: Race & ethnicity among Oregon youth

Oregon youth, 2017
Single non-Latino race & Latino ethnicity

- White, 68%
- Latino, 23%
- African American/Black, 2%
- Pacific Islander, 1%
- Asian, 5%
- American Indian/AK Native, 1%

Disparities in Oregon Juvenile Justice, 2015

Referrals to Juvenile Departments

1. Used Census Bureau/National Center for Health Statistics, Estimates by county, age, unbridged race, Hispanic origin, and sex (2017). Non-Hispanic multiracial was not included.
Preliminary Results: Racial disparities

*County and age-specific cannabis use estimates were used to estimate the population of cannabis users within each racial group. This method did not consider differences in cannabis use between racial & ethnic groups within Oregon counties among Oregon youth over time.

ALLEGATIONS PER 100,000 CANNABIS-USING YOUTH*
### Preliminary Results: Impacts on Racial disparities

#### Before Legalization

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Disparity Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American/Black</td>
<td>3.1 (2.8, 3.5)</td>
</tr>
<tr>
<td>Latino</td>
<td>0.9 (0.9, 1.0)</td>
</tr>
<tr>
<td>American Indian/Alaska Native</td>
<td>2.4 (2.2, 2.7)</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>0.4 (0.3, 0.5)</td>
</tr>
</tbody>
</table>

#### After Legalization

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Disparity Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American/Black</td>
<td>1.9 (1.7, 2.2)</td>
</tr>
<tr>
<td>Latino</td>
<td>0.7 (0.7, 0.8)</td>
</tr>
<tr>
<td>American Indian/Alaska Native</td>
<td>2.1 (1.8, 2.4)</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>0.2 (0.2, 0.3)</td>
</tr>
</tbody>
</table>

*Compared to non-Latino whites

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† The multi-level negative binomial model included a random intercept by county effect and was offset by county-level population estimates for age-specific cannabis users. The effects of age, race/ethnicity, gender, month of allegation & count of sworn police officers within each county were adjusted for.
Preliminary Results: Impacts on Racial Disparities (2)

Relative disparities for African American/Black youth significantly decreased after legalization but not for American Indian/Alaska Native youth.

Though, large disparities in marijuana-related allegations remain after legalization.
- The risk of marijuana-related allegations among African American/Black cannabis-using youth remained 1.9 times greater than the risk among white youth.
- For American Indian/Alaska Native youth, the risk of allegations remained 2.1 times the risk for non-Latino white youth.

*Compared to non-Latino whites
Study limitations
Limitations: Study design

- An ecological study design was used
  - Results can not be interpreted as an individual’s risk of receiving a marijuana-related criminal allegation after adult legalization

- An ecologic design was necessary in order to assess statewide impacts of legalization on juvenile justice.
Limitations: Population concerns

- Sensitivity analysis using all youth as population offset showed consistent results.
- Concern over using school-based survey data to estimate youth use.
  - Youth who were institutionalized or dropped out were excluded from the survey (and may be at highest risk of substance use).
  - We felt school-based survey data was our best option to produce reliable annual estimates of marijuana use at the county-level.
- Results did not consider differences in cannabis use by race/ethnicity over time.
Takeaways

- There is evidence that the rate of marijuana-related allegations among cannabis-using youth increased after legalization.
  - The increased rate can not be explained by changes in cannabis use among youth and may be a result of changes in criminal justice policies or enforcement practices.

- Preliminary results suggest that racial & ethnic disparities within marijuana-related allegations persisted after legalization.
  - Relative disparities were highest among non-Latino American Indian/Alaska Native youth compared to non-Latino white youth.

- Continuing to monitor trends in juvenile justice outcomes will be crucial to understand impacts of local cannabis policies.
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Caislin Firth, MPH
PhD Candidate
Epidemiology Department
University of Washington School of Public Health
Seattle, Washington
caislin@uw.edu

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http://adai.washington.edu/
### Results: Preliminary Impacts on Racial Disparities among Full Population

<table>
<thead>
<tr>
<th>Disparity Compared to Non-Latino White Youth*</th>
<th>Rate Ratio</th>
<th>95% Conf Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before Legalization (&lt;July 2015)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Latino African American/Black</td>
<td>3.081</td>
<td>(2.756–3.445)</td>
</tr>
<tr>
<td>Latino</td>
<td>0.940</td>
<td>(0.879–1.006)</td>
</tr>
<tr>
<td>Non-Latino American Indian/AK Native</td>
<td>2.440</td>
<td>(2.178–2.735)</td>
</tr>
<tr>
<td>Non-Latino Asian/Pacific Islander</td>
<td>0.395</td>
<td>(0.331–0.471)</td>
</tr>
<tr>
<td><strong>After Legalization (≥July 2015)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Latino African American/Black</td>
<td>2.030</td>
<td>(1.772–2.325)</td>
</tr>
<tr>
<td>Latino</td>
<td>0.733</td>
<td>(0.680–0.790)</td>
</tr>
<tr>
<td>Non-Latino American Indian/AK Native</td>
<td>2.158</td>
<td>(1.899–2.452)</td>
</tr>
<tr>
<td>Non-Latino Asian/Pacific Islander</td>
<td>0.240</td>
<td>(0.193–0.230)</td>
</tr>
</tbody>
</table>

*Significant reduction in disparity after decriminalization compared to before decriminalization (p-value <0.05).

*The multi-level negative binomial model included a random intercept by county effect and was offset by county-level population estimates. The effects of age, race/ethnicity, gender, month of allegation & count of sworn police officers within each county were adjusted for.
Marijuana MIP in Oregon

475B.316 Prohibition against person under 21 years of age possessing, attempting to purchase or purchasing marijuana item; penalty. (1)(a) A person under 21 years of age may not possess, attempt to purchase or purchase a marijuana item.

(b) For purposes of this subsection, purchasing a marijuana item includes accepting a marijuana item, and possessing a marijuana item includes consuming a marijuana item, provided that the consumption of the marijuana item occurred no more than 24 hours before the determination that the person consumed the marijuana item.

(2) Except as authorized by the Oregon Liquor Control Commission by rule, or as necessary in an emergency, a person under 21 years of age may not enter or attempt to enter any portion of a premises that is posted or otherwise identified as being prohibited to the use of persons under 21 years of age.

(3)(a) Except as provided in paragraph (b) of this subsection, a person who violates subsection (1) or (2) of this section commits a Class B violation.

Alcohol MIP for comparison…

SECTION 1. ORS 471.430 is amended to read:
471.430. (1) A person under 21 years of age may not attempt to purchase, purchase or acquire alcoholic beverages. Except when such minor is in a private residence accompanied by the parent or guardian of the minor and with such parent's or guardian's consent, a person under 21 years of age may not have personal possession of alcoholic beverages.

(2) For the purposes of this section, personal possession of alcoholic beverages includes the acceptance or consumption of a bottle of such beverages, or any portion thereof, or a drink of such beverages. However, this section does not prohibit the acceptance or consumption by any person of sacramental wine as part of a religious rite or service.

(3) Except as authorized by rule or as necessary in an emergency, a person under 21 years of age may not enter or attempt to enter any portion of a licensed premises that is posted or otherwise identified as being prohibited to the use of minors.

(4)(a) Except as provided in paragraph (b) of this subsection, a person who violates subsection (1) or (3) of this section commits a Class B violation.
Preliminary Evidence: Adult marijuana-related crimes in legalized states


Washington State

Colorado

Oregon

2019 North American Cannabis Summit
Youth Marijuana allegations by crime type

Adult legalization of small amounts of marijuana
Cannabis retailers
Results: Cannabis retailers in Oregon

Cannabis Retailers, Sept 2018

Cannabis Retailers, Oct 2015

Cannabis Retailers, Dec 2016

Cannabis Retailers, Dec 2017
## Results: Effects of cannabis retailers among full population

<table>
<thead>
<tr>
<th>Cannabis retailers compared to before decriminalization (&lt; July 2015)</th>
<th>Rate Ratio*</th>
<th>95% Conf Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>No stores</td>
<td>1.534</td>
<td>(1.289–1.828)</td>
</tr>
<tr>
<td>1-4 stores</td>
<td>1.738</td>
<td>(1.478–2.043)</td>
</tr>
<tr>
<td>5-6 stores</td>
<td>1.459</td>
<td>(1.230–1.731)</td>
</tr>
<tr>
<td>7-10 stores</td>
<td>1.568</td>
<td>(1.320–1.861)</td>
</tr>
<tr>
<td>11-21 stores</td>
<td>1.452</td>
<td>(1.250–1.689)</td>
</tr>
<tr>
<td>22-171 stores</td>
<td>1.126</td>
<td>(0.967–1.311)</td>
</tr>
</tbody>
</table>

*The multi-level negative binomial model included a random intercept by county effect and was offset by county-level population estimates for current marijuana users within each demographic group. The effects of decriminalization, age, race/ethnicity, gender, month of allegation & count of sworn police officers within each county were adjusted for.*
## Results: Effects of cannabis retailers

A multi-level negative binomial model was used to analyze the effects of cannabis retailers compared to before decriminalization (< July 2015).

<table>
<thead>
<tr>
<th>Cannabis retailers compared to before decriminalization (&lt; July 2015)</th>
<th>Rate Ratio*</th>
<th>95% Conf Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>No stores</td>
<td>1.476</td>
<td>(1.237–1.760)</td>
</tr>
<tr>
<td>1-4 stores</td>
<td>1.624</td>
<td>(1.381–1.910)</td>
</tr>
<tr>
<td>5-6 stores</td>
<td>1.337</td>
<td>(1.126–1.587)</td>
</tr>
<tr>
<td>7-10 stores</td>
<td>1.371</td>
<td>(1.153–1.629)</td>
</tr>
<tr>
<td>11-21 stores</td>
<td>1.414</td>
<td>(1.216–1.645)</td>
</tr>
<tr>
<td>22-171 stores</td>
<td>1.023</td>
<td>(0.878–1.192)</td>
</tr>
</tbody>
</table>

*The multi-level negative binomial model included a random intercept by county effect and was offset by county-level population estimates for age-specific current cannabis users. The effects of decriminalization, age, race/ethnicity, gender, month of allegation & count of sworn police officers within each county were adjusted for.

- Trends in marijuana-related allegations did not significantly change with the opening of any marijuana retailers across Oregon counties (Rate Ratio 1.002, 95% CI: 0.998–1.006).

- Among counties with less than 22 marijuana retailers or no retailers at all, the risk of allegations among cannabis using youth did significantly increase after market opening.

- Counties with the greatest number of marijuana retailers (22-171 stores) were not associated with a significant increase in marijuana-related allegations among cannabis using youth.
Did count of cannabis retailers miss the mark?

- Count of cannabis retailers is not density
  - A density metric would capture distance to closest retailers

- Confounding by space?
  - Counties may be too large to capture variance in exposure within counties (cities vs. unincorporated counties)

- Unmeasured alternative explanation?
  - We incorporated a random intercept by county in models
  - We adjusted for rural designation of counties (frontier, rural, urban/rural & urban)
  - We considered policing resources (number of sworn officers in each county)